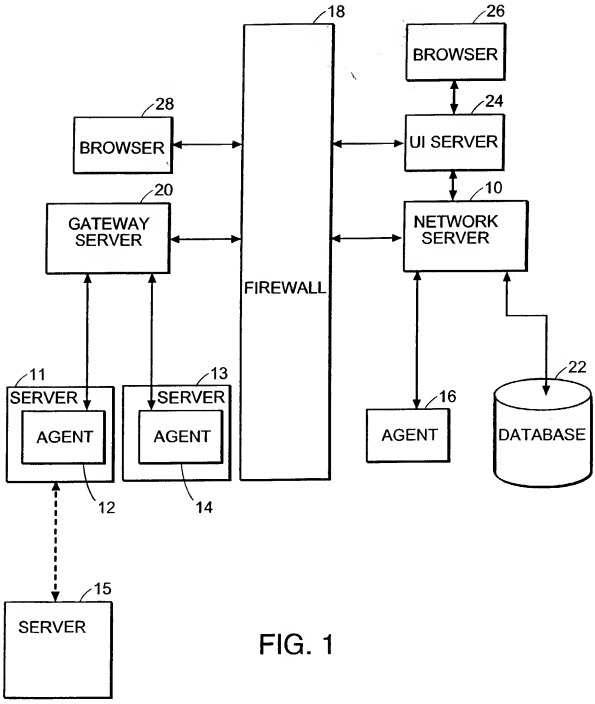
18
26
BROWSER
28
BROWSER
24
UI SERVER
20
GATEWAY SERVER
10
NETWORK SERVER
FIREWALL
11
SERVER
AGENT
13
SERVER
AGENT
16
AGENT
22
DATABASE
12
14
15
SERVER

FIG. 1

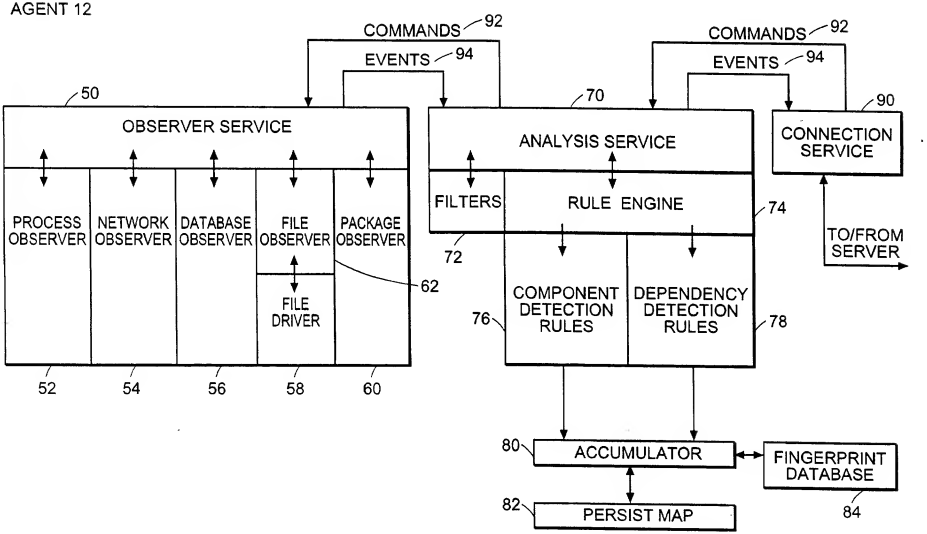

FIG. 2

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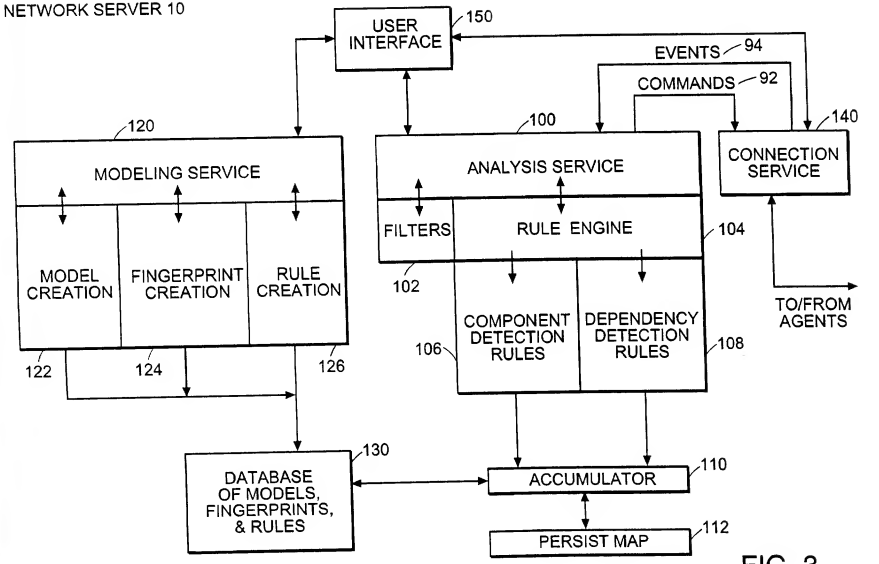
NETWORK SERVER 10
USER INTERFACE
150
EVENTS
94
COMMANDS
92
120
100
140
MODELING SERVICE
ANALYSIS SERVICE
CONNECTION SERVICE
FILTERS
RULE ENGINE
104
MODEL CREATION
FINGERPRINT CREATION
RULE CREATION
102
TO/FROM AGENTS
COMPONENT DETECTION RULES
DEPENDENCY DETECTION RULES
106
108
122
124
126
DATABASE OF MODELS, FINGERPRINTS, & RULES
130
ACCUMULATOR
110
PERSIST MAP
112

FIG. 3

F1

PASSIVE ELEMENTS	FILE1.exe FILE2.txt FILE3.dat . . . FILEX.xxx	ORGANIZATIONAL INFORMATION
ACTIVE ELEMENTS	COMMAND: CHECK SIZE AND CHECKSUM OF FILE1.exe MATCH: SUB1 OR SUB2	

FIG. 4

SUB 1

MATCH F1 ACTIVE ELEMENTS
SIZE OF FILE1.exe =XXX
CHECKSUM OF FILE 1.exe=YYY

FIG. 5A

SUB 2

MATCH F1 ACTIVE ELEMENTS
SIZE OF FILE1.exe =ZZZ
CHECKSUM OF FILE 1.exe=BBB

FIG. 5B

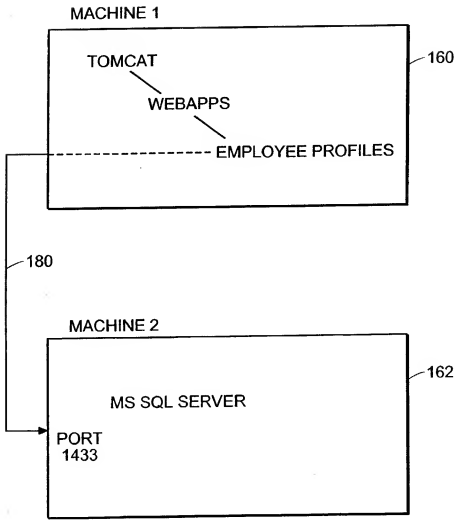
MACHINE 1
TOMCAT
WEBAPPS
EMPLOYEE PROFILES
160
180
MACHINE 2
MS SQL SERVER
PORT
1433
162

FIG. 6

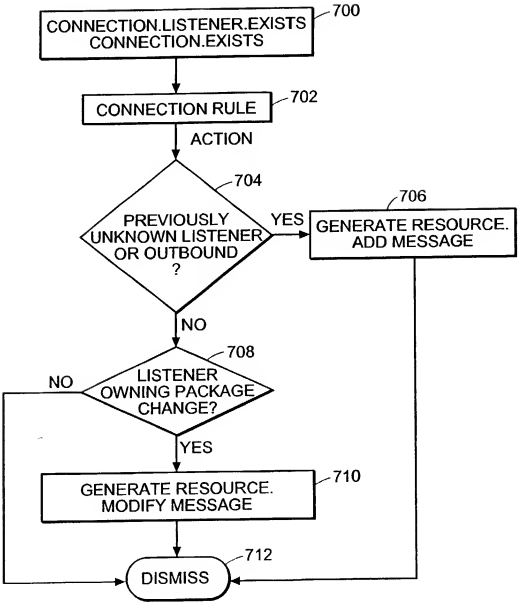
CONNECTION.LISTENER.EXISTS
CONNECTION.EXISTS
700
CONNECTION RULE
702
ACTION
704
PREVIOUSLY UNKNOWN LISTENER OR OUTBOUND ?
YES
706
GENERATE RESOURCE. ADD MESSAGE
NO
708
LISTENER OWNING PACKAGE CHANGE?
NO
YES
GENERATE RESOURCE. MODIFY MESSAGE
710
712
DISMISS

FIG. 7A

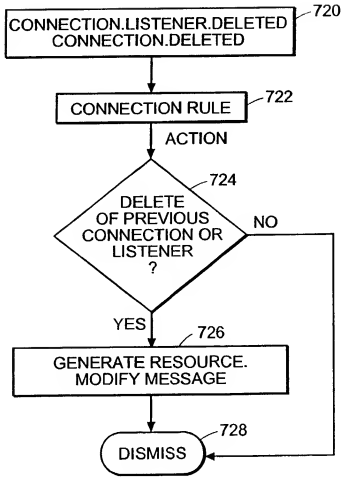
CONNECTION.LISTENER.DELETED
CONNECTION.DELETED
720
CONNECTION RULE
722
ACTION
724
DELETE OF PREVIOUS CONNECTION OR LISTENER ?
NO
YES
726
GENERATE RESOURCE. MODIFY MESSAGE
728
DISMISS

FIG. 7B

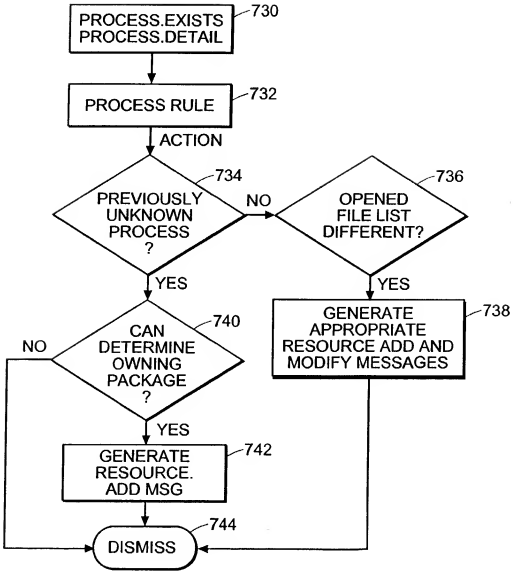
PROCESS.EXISTS
PROCESS.DETAIL
730
PROCESS RULE
732
ACTION
PREVIOUSLY UNKNOWN PROCESS ?
734
NO
OPENED FILE LIST DIFFERENT?
736
YES
YES
CAN DETERMINE OWNING PACKAGE ?
740
NO
GENERATE APPROPRIATE RESOURCE ADD AND MODIFY MESSAGES
738
YES
GENERATE RESOURCE. ADD MSG
742
DISMISS
744

FIG. 7C

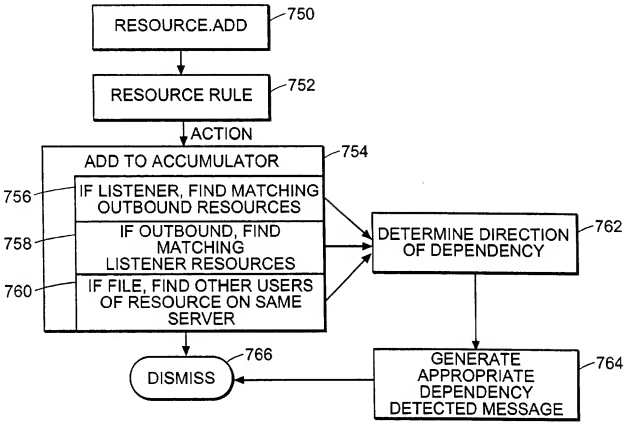
RESOURCE.ADD
750
RESOURCE RULE
752
ACTION
ADD TO ACCUMULATOR
754
IF LISTENER, FIND MATCHING OUTBOUND RESOURCES
756
IF OUTBOUND, FIND MATCHING LISTENER RESOURCES
758
IF FILE, FIND OTHER USERS OF RESOURCE ON SAME SERVER
760
DETERMINE DIRECTION OF DEPENDENCY
762
GENERATE APPROPRIATE DEPENDENCY DETECTED MESSAGE
764
DISMISS
766

FIG. 7D

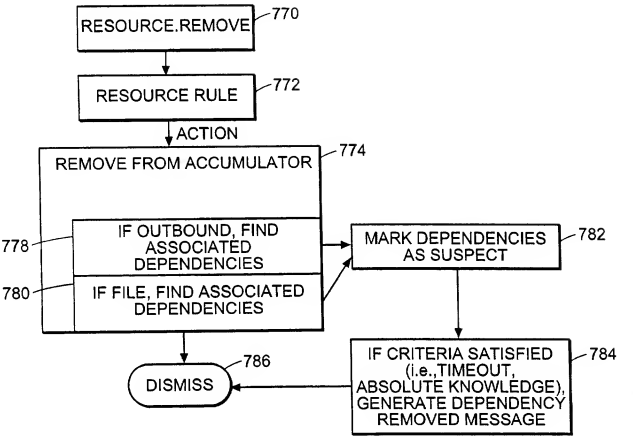
RESOURCE.REMOVE
770
RESOURCE RULE
772
ACTION
REMOVE FROM ACCUMULATOR
774
778
IF OUTBOUND, FIND ASSOCIATED DEPENDENCIES
780
IF FILE, FIND ASSOCIATED DEPENDENCIES
MARK DEPENDENCIES AS SUSPECT
782
DISMISS
786
IF CRITERIA SATISFIED (i.e.,TIMEOUT, ABSOLUTE KNOWLEDGE), GENERATE DEPENDENCY REMOVED MESSAGE
784

FIG. 7E

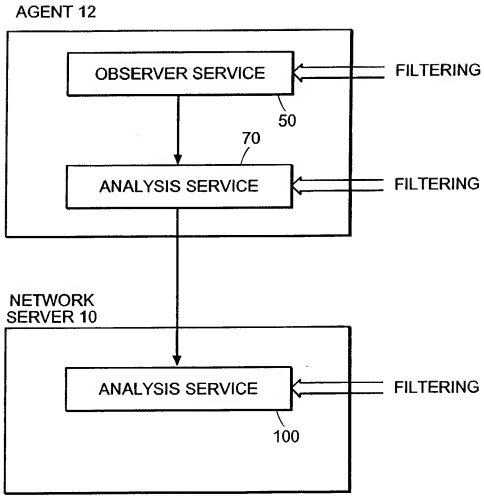
AGENT 12
OBSERVER SERVICE
FILTERING
50
70
ANALYSIS SERVICE
FILTERING
NETWORK
SERVER 10
ANALYSIS SERVICE
FILTERING
100

FIG. 8

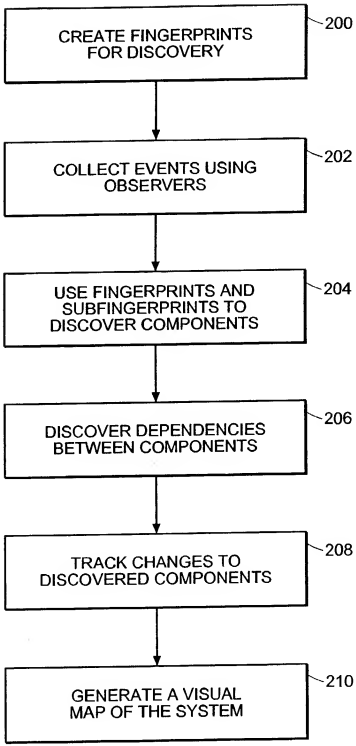
CREATE FINGERPRINTS FOR DISCOVERY
200
COLLECT EVENTS USING OBSERVERS
202
USE FINGERPRINTS AND SUBFINGERPRINTS TO DISCOVER COMPONENTS
204
DISCOVER DEPENDENCIES BETWEEN COMPONENTS
206
TRACK CHANGES TO DISCOVERED COMPONENTS
208
GENERATE A VISUAL MAP OF THE SYSTEM
210

FIG. 9

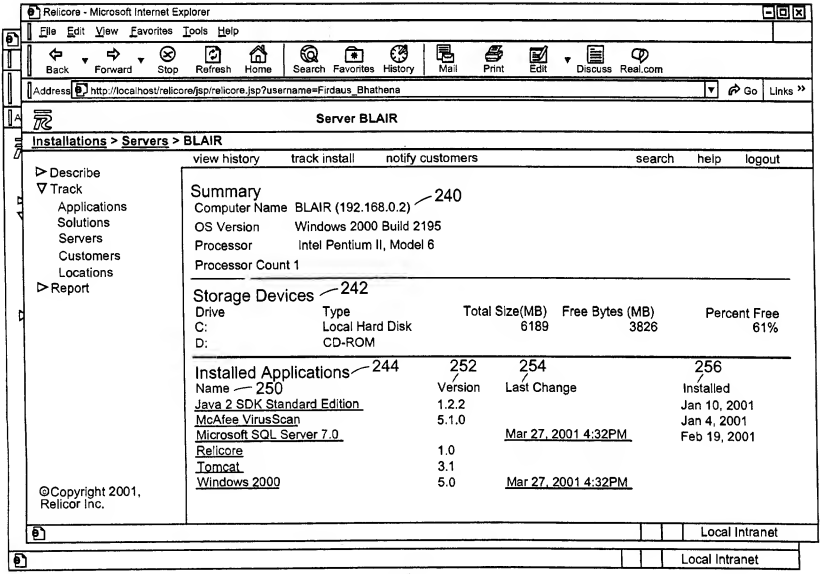

FIG. 10

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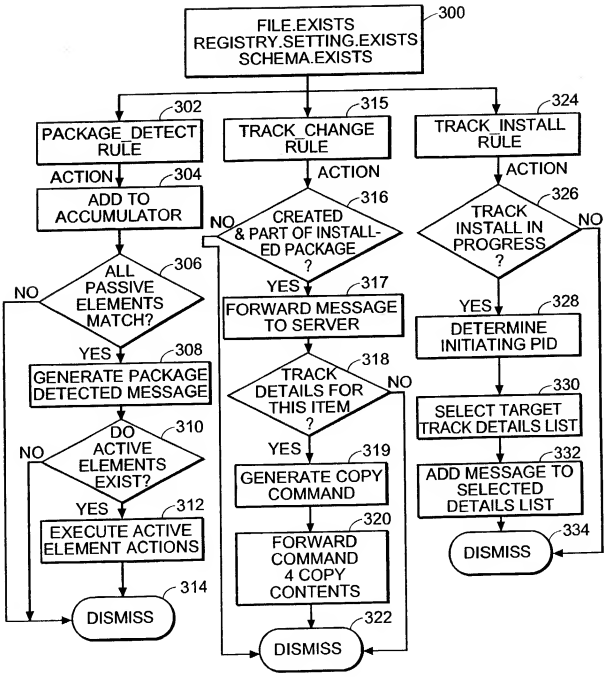
FILE.EXISTS
REGISTRY.SETTING.EXISTS
SCHEMA.EXISTS
300
PACKAGE_DETECT RULE
302
ACTION
ADD TO ACCUMULATOR
304
ALL PASSIVE ELEMENTS MATCH?
306
NO
YES
GENERATE PACKAGE DETECTED MESSAGE
308
DO ACTIVE ELEMENTS EXIST?
310
NO
YES
EXECUTE ACTIVE ELEMENT ACTIONS
312
DISMISS
314
TRACK_CHANGE RULE
315
ACTION
CREATED & PART OF INSTALL-ED PACKAGE ?
316
NO
YES
FORWARD MESSAGE TO SERVER
317
TRACK DETAILS FOR THIS ITEM ?
318
NO
YES
GENERATE COPY COMMAND
319
FORWARD COMMAND 4 COPY CONTENTS
320
DISMISS
322
TRACK_INSTALL RULE
324
ACTION
TRACK INSTALL IN PROGRESS ?
326
NO
YES
DETERMINE INITIATING PID
328
SELECT TARGET TRACK DETAILS LIST
330
ADD MESSAGE TO SELECTED DETAILS LIST
332
DISMISS
334

FIG. 11

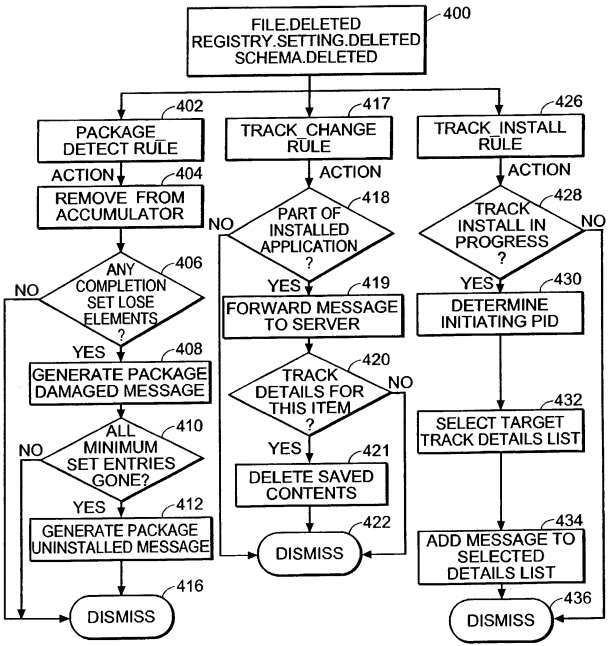
400
FILE.DELETED
REGISTRY.SETTING.DELETED
SCHEMA.DELETED
402
PACKAGE DETECT RULE
ACTION
404
REMOVE FROM ACCUMULATOR
406
ANY COMPLETION SET LOSE ELEMENTS ?
NO
YES
408
GENERATE PACKAGE DAMAGED MESSAGE
410
ALL MINIMUM SET ENTRIES GONE?
NO
YES
412
GENERATE PACKAGE UNINSTALLED MESSAGE
416
DISMISS
417
TRACK_CHANGE RULE
ACTION
418
PART OF INSTALLED APPLICATION ?
NO
YES
419
FORWARD MESSAGE TO SERVER
420
TRACK DETAILS FOR THIS ITEM ?
NO
YES
421
DELETE SAVED CONTENTS
422
DISMISS
426
TRACK_INSTALL RULE
ACTION
428
TRACK INSTALL IN PROGRESS ?
NO
YES
430
DETERMINE INITIATING PID
432
SELECT TARGET TRACK DETAILS LIST
434
ADD MESSAGE TO SELECTED DETAILS LIST
436
DISMISS

FIG. 12

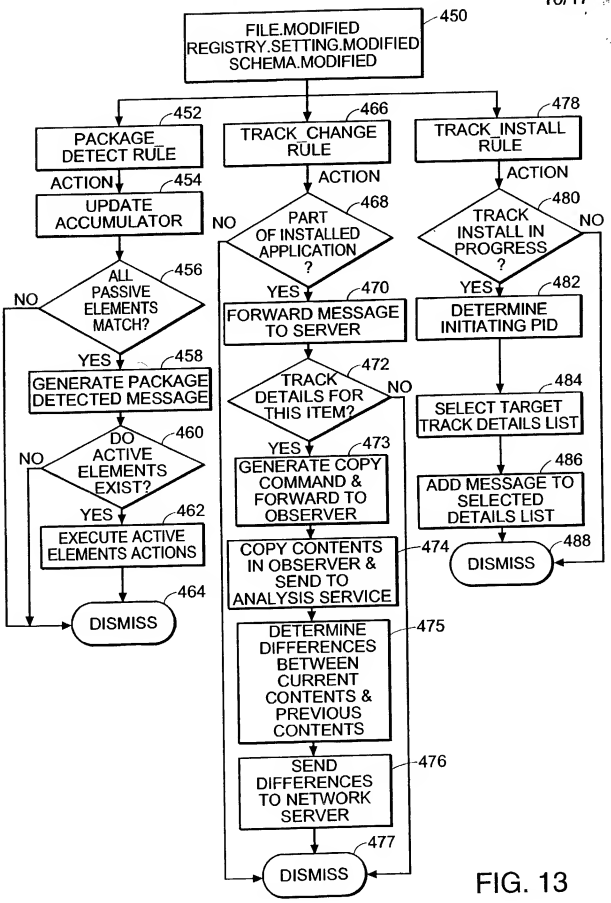
FILE.MODIFIED
REGISTRY.SETTING.MODIFIED
SCHEMA.MODIFIED
450
PACKAGE DETECT RULE
452
ACTION
UPDATE ACCUMULATOR
454
ALL PASSIVE ELEMENTS MATCH?
456
NO
YES
GENERATE PACKAGE DETECTED MESSAGE
458
DO ACTIVE ELEMENTS EXIST?
460
NO
YES
EXECUTE ACTIVE ELEMENTS ACTIONS
462
DISMISS
464
TRACK_CHANGE RULE
466
ACTION
PART OF INSTALLED APPLICATION ?
468
NO
YES
FORWARD MESSAGE TO SERVER
470
TRACK DETAILS FOR THIS ITEM?
472
NO
YES
GENERATE COPY COMMAND & FORWARD TO OBSERVER
473
COPY CONTENTS IN OBSERVER & SEND TO ANALYSIS SERVICE
474
DETERMINE DIFFERENCES BETWEEN CURRENT CONTENTS & PREVIOUS CONTENTS
475
SEND DIFFERENCES TO NETWORK SERVER
476
DISMISS
477
TRACK_INSTALL RULE
478
ACTION
TRACK INSTALL IN PROGRESS ?
480
NO
YES
DETERMINE INITIATING PID
482
SELECT TARGET TRACK DETAILS LIST
484
ADD MESSAGE TO SELECTED DETAILS LIST
486
DISMISS
488

FIG. 13

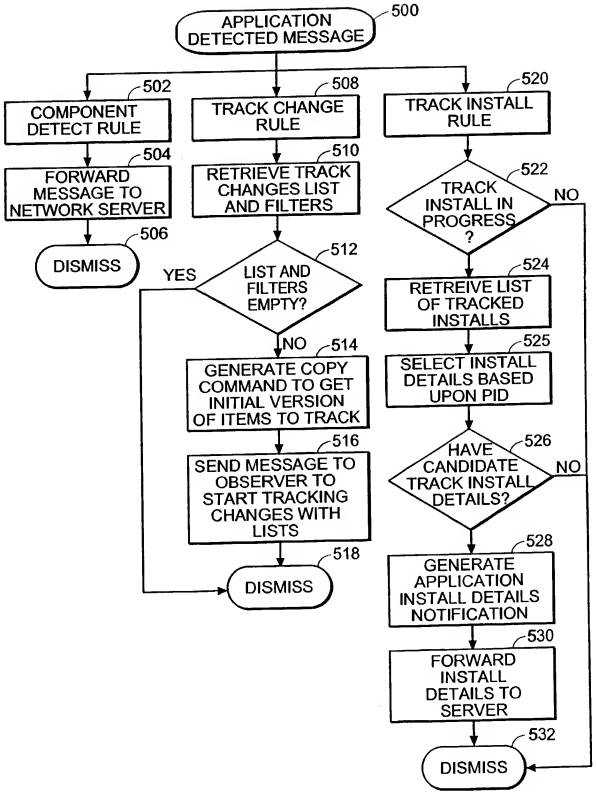
APPLICATION DETECTED MESSAGE
500
COMPONENT DETECT RULE
502
FORWARD MESSAGE TO NETWORK SERVER
504
DISMISS
506
TRACK CHANGE RULE
508
RETRIEVE TRACK CHANGES LIST AND FILTERS
510
LIST AND FILTERS EMPTY?
512
YES
NO
GENERATE COPY COMMAND TO GET INITIAL VERSION OF ITEMS TO TRACK
514
SEND MESSAGE TO OBSERVER TO START TRACKING CHANGES WITH LISTS
516
DISMISS
518
TRACK INSTALL RULE
520
TRACK INSTALL IN PROGRESS ?
522
NO
RETREIVE LIST OF TRACKED INSTALLS
524
SELECT INSTALL DETAILS BASED UPON PID
525
HAVE CANDIDATE TRACK INSTALL DETAILS?
526
NO
GENERATE APPLICATION INSTALL DETAILS NOTIFICATION
528
FORWARD INSTALL DETAILS TO SERVER
530
DISMISS
532

FIG. 14